



Hydraulic Motor/Pump Series F11/F12

Fixed Displacement



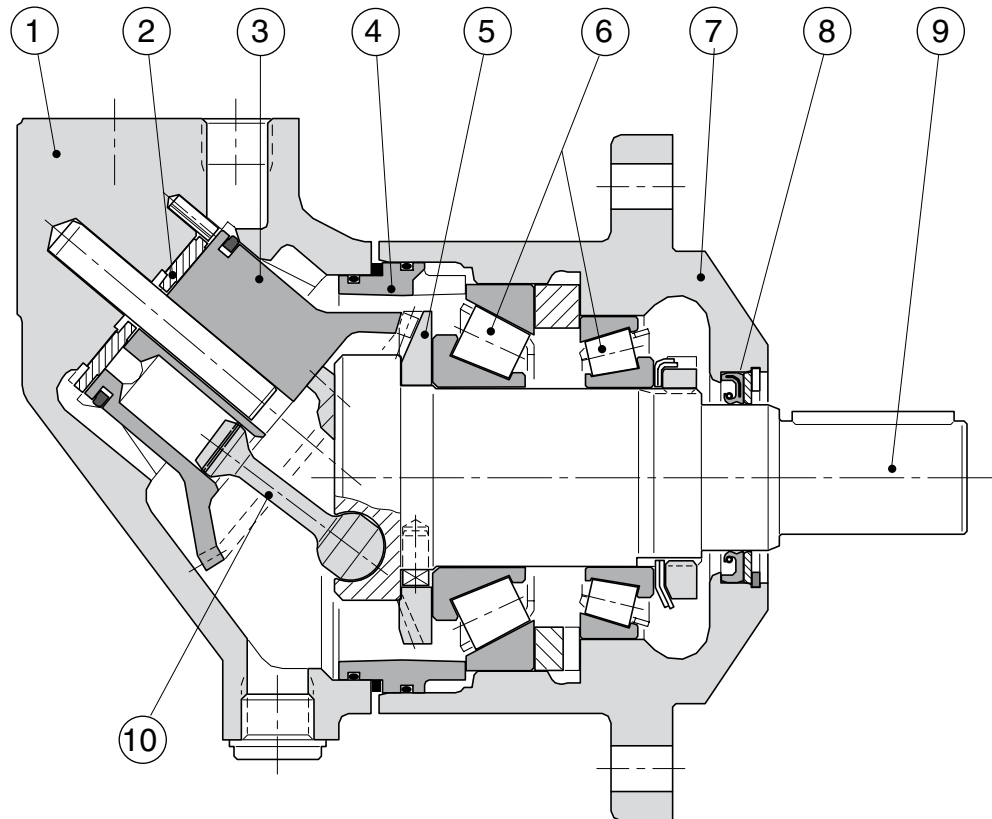
F11 and F12 are bent axis, fixed displacement heavy-duty motor/pump series. They can be used in numerous applications in both open and closed loop circuits.

- Series F11 is available in the following frame sizes and versions:
 - F11-5, -10, -12, -14, -19 and -150 with CETOP mounting flange and shaft end
 - F11-10, -12 and -14 with ISO flange and shaft
 - F11-10, -12, -14, -19, -150 and -250 with SAE flange and shaft
- Series F12 conforms to current ISO and SAE mounting flange and shaft end configurations. A very compact cartridge version is also available.
- Thanks to the unique spherical piston design, F11/F12 motors can be used at unusually high shaft speeds. Operating pressures to 480 bar provides for the high output power capability.
- The 40° angle between shaft and cylinder barrel allows for a very compact, lightweight motor/pump.

- The laminated piston ring offers important advantages such as low internal leakage and thermal shock resistance.
- The pump version has highly engineered valve plates for increased selfpriming speed and low noise, available with left and right hand rotation.
- The F11/F12 motors produce very high torque at start-up as well as at low speeds.
- Our unique timing gear design synchronizes shaft and cylinder barrel, making the F11/F12 very tolerant to high 'G' forces and torsional vibrations.
- Heavy duty roller bearings permit substantial external axial and radial shaft loads.
- The F11's and F12's have a simple and straight-forward design with very few moving parts, making them very reliable motors/pumps.
- The unique piston locking, timing gear and bearing set-up as well as the limited number of parts add up to a very robust design with long service life and, above all, proven reliability.

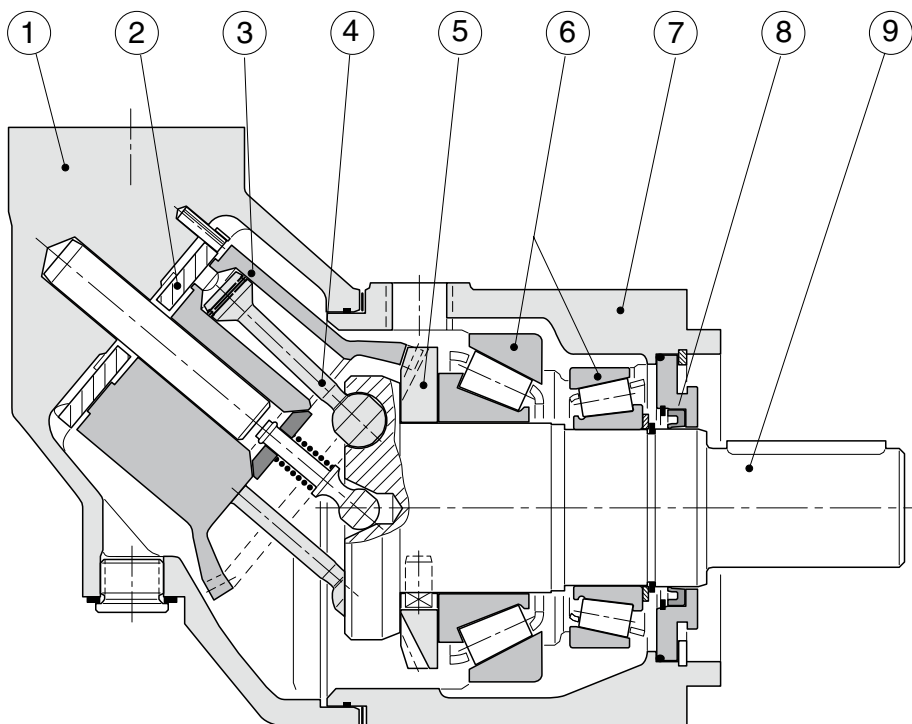
F11 cross section

1. Barrel housing
2. Valve plate
3. Cylinder barrel
4. Guide spacer with O-rings
5. Timing gear
6. Roller bearing
7. Bearing housing
8. Shaft seal
9. Output/input shaft
10. Piston with laminated piston ring



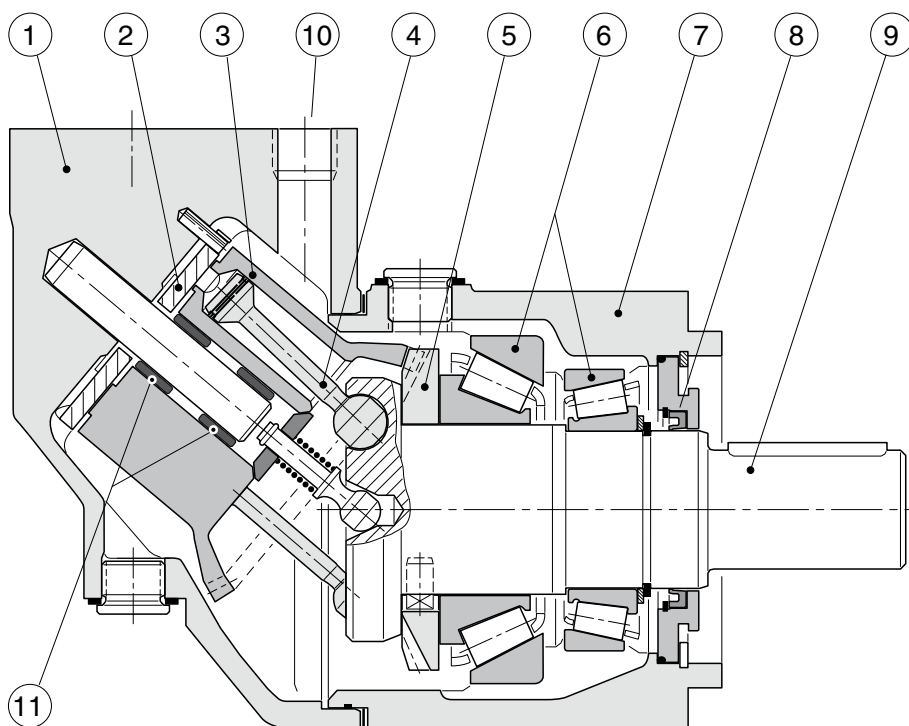
F12 cross sections

F12-30, -40, -60, -80 and -90
(F12-60 shown)



- Legend:
- | | | |
|----------------------------|----------------------------|--|
| 1. Barrel housing | 5. Timing gear | 9. Output/input shaft |
| 2. Valve plate | 6. Tapered roller bearings | 10. Port E (F12-110 and -125) |
| 3. Cylinder barrel | 7. Bearing housing | 11. Needle bearings (F12-110 and -125) |
| 4. Piston with piston ring | 8. Shaft seal | |

F12-110 and -125
(F12-110 shown)



Specifications**Hydraulic motor/pump
Series F11/F12**

Frame size F11	-5	-10	-12	-14	-19	-150	-250
Displacement [cm ³ /rev]	4.9	9.8	12.5	14.3	19.0	150	242
Operating pressure							
max intermittent ¹⁾ [bar]	420	_____	_____	_____	_____	_____	420
max continuous [bar]	350	_____	_____	_____	_____	_____	350
Motor operating speed [rpm]							
max intermittent ¹⁾	14 000	11 200	10 300	9 900	8 900	3 500	3 000
max continuous	12 800	10 200	9 400	9 000	8 100	3 200	2 700
min continuous	50	_____	_____	_____	50	200	200
Max pump selfpriming speed²⁾							
L or R function; max [rpm]	4 600	4 200	3 850	3 500	3 500	1 700	1 500
Motor input flow							
max intermittent ¹⁾ [l/min]	58	108	120	143	171	450	650
max continuous [l/min]	52	97	85	128	153	390	580
Main circuit temp.³⁾, max [°C]	80	_____	_____	_____	_____	_____	80
min [°C]	-40	_____	_____	_____	_____	_____	-40
Mass moment of inertia							
(x10 ⁻³) [kg m ²]	0.16	0.39	0.40	0.42	1.1	40	46
Weight [kg]	5	7.5	8.3	8.3	11	70	77

Frame size F12	-30	-40	-60	-80	-90	-110	-125
Displacement [cm ³ /rev]	30.0	40.0	59.8	80.4	93.0	110.1	125.0
Operating pressure							
max intermittent ¹⁾ [bar]	480	_____	_____	480	420	480	480
max continuous [bar]	420	_____	_____	420	350	420	420
Motor operating speed [rpm]							
max intermittent ¹⁾	7 300	6 700	5 800	5 300	5 000	4 800	4 600
max continuous	6 700	6 100	5 300	4 800	4 600	4 400	4 200
min continuous	50	_____	_____	_____	_____	_____	50
Max pump selfpriming speed²⁾							
L or R function; max [rpm]	3150	2870	2500	2300	2 250	2290	2 100
Motor input flow							
max intermittent ¹⁾ [l/min]	213	256	335	418	467	517	567
max continuous [l/min]	168	200	257	322	359	396	426
Main circuit temp.³⁾, max [°C]	80	_____	_____	_____	_____	_____	80
min [°C]	-40	_____	_____	_____	_____	_____	-40
Mass moment of inertia							
(x10 ⁻³) [kg m ²]	1.7	2.9	5	8.4	8.4	11.2	11.2
Weight [kg]	12	16.5	21	26	26	36	36

1) Intermittent: max 6 seconds in any one minute.

2) Selfpriming speed valid at sea level.

3) See also installation information, operating temperature.

Preferred versions F11/F12**F11**

Ordering Codes	Part number
F11-005-MB-CN-K-000-000-0	3703665
F11-005-MB-CH-K-000-000-0	3707249
F11-005-HU-CH-K-000-000-0	3707308
F11-010-MB-CN-K-000-000-0	3703603
F11-010-MB-CH-K-000-000-0	3706030
F11-010-HU-CH-K-000-000-0	3707310
F11-012-HB-CV-K-000-000-0	3785267
F11-012-HB-CE-K-000-000-0	3785874
F11-014-HB-CE-K-000-000-0	3783201
F11-014-HB-CV-K-000-000-0	3782830
F11-019-MB-CN-K-000-000-0	3703516
F11-019-MB-CH-K-000-000-0	3707893
F11-150-MF-CN-K-000-000-0	3703468
F11-150-MF-CH-K-000-000-0	3707008
F11-150-HF-SH-S-000-000-0	3707325
F11-250-QF-SH-F-000-000-0	3706440
F11-250-QF-SH-K-000-000-0	3795858

F12

Ordering Codes	Part number
F12-030-MF-IH-D-000-000-0	3799843
F12-030-MF-IH-K-000-000-0	3799844
F12-030-MS-SH-S-000-000-0	3799851
F12-030-MS-TH-S-000-000-0	3799616
F12-040-MF-IH-D-000-000-0	3799525
F12-040-MF-IH-K-000-000-0	3799526
F12-040-MS-SH-S-000-000-0	3799532
F12-040-MS-SH-T-000-000-0	3799533
F12-040-MS-TH-S-000-000-0	3799617
F12-060-MF-IH-D-000-000-0	3799988
F12-060-MF-IH-K-000-000-0	3799989
F12-060-MS-SH-S-000-000-0	3799998
F12-060-MS-TH-S-000-000-0	3799618
F12-080-MF-IH-D-000-000-0	3780767
F12-080-MF-IH-K-000-000-0	3780772
F12-080-MS-SH-S-000-000-0	3780783
F12-090-MF-IH-D-000-000-0	3785518
F12-090-MF-IH-K-000-000-0	3785609
F12-090-MS-SH-S-000-000-0	3785875
F12-110-MF-IH-D-000-000-0	3781530
F12-110-MF-IH-K-000-000-0	3781534
F12-110-MS-SH-S-000-000-0	3781542
F12-125-MF-IH-D-000-000-0	3785866
F12-125-MF-IH-K-000-000-0	3785717
F12-125-MS-SH-S-000-000-0	3785504